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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/939,700	08/28/2001	Toshiki Tanaka	826.1746	4440
21171	7590	04/07/2004	EXAMINER	
STAAS & HALSEY LLP SUITE 700 1201 NEW YORK AVENUE, N.W. WASHINGTON, DC 20005			CUNNINGHAM, STEPHEN C	
			ART UNIT	PAPER NUMBER
			3663	

DATE MAILED: 04/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/939,700

Applicant(s)

TANAKA ET AL.

Examiner

Stephen C. Cunningham

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 31 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 4,5,11-13,15 and 16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 4,5,11-13,15 and 16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 03 March 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Claim Rejections - 35 USC § 112

The rejections of claims 15 and 16 bases on the second paragraph of 35 U.S.C. 112 have been overcome and are withdrawn.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

1. Claims 4, 5, and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Namiki et al. (2001/0050802) (Namiki) in view of Kidorf et al. (6,052,219) (Kidorf) and further in view of Giles et al. (5,241,414) (Giles).

With respect to claim 4 and 5, Namiki teaches an optical transmission system where a plurality of Raman amplifiers (see 0019) are positioned on an optical transmission line, and each of the Raman amplifiers uses a plurality of pump lights (see 0058) wherein when a power of a pump light having a first wavelength among the plurality of pump lights drops to a predetermined level or lower (Namiki refers to this as "failure") in a first Raman amplifier among the plurality of Raman amplifiers, power of a pump light having the first wavelength or a wavelength that is substantially the same as the first wavelength is raised in one or some of the plurality of Raman amplifiers other than the first Raman amplifier (see 0069 and 0072), and/or (with respect to claim 5), the power of a pump light having a wavelength adjacent to the first wavelength is raised in the

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first Raman amplifier (see 0169, describing how when pump 8 fails, pump 7 is activated to compensate for the failure).

Kidorf teaches an optical transmission system wherein a plurality of optical amplifiers amplify optical signals on a system including a first and a second optical transmission line.

Neither Namiki nor Kidorf teach an optical device to multiplex light pump light and guide the multiplexed pump light to both of the first and second optical transmission lines. Such a device was well known in the art at the time of invention by Applicant, for example see Giles' M x N Star coupler.

It would have been obvious to modify the apparatus, of Namiki, by providing a second transmission line transmitting signals counter-directionally to first transmission line in order for to information to be transmitted in both directions and to further modify the apparatus by substituting Giles' star coupler in order to provide pump light to multiple amplifiers without requiring an increased number of pump sources.

With respect to claim 13, Namiki teaches that each of the Raman amplifiers in the system can be Raman amplifiers according to the disclosure therein. Furthermore, Namiki teaches that the multiplexers are selected and arranged so that an average characteristic of the multiplexers becomes a predetermined characteristic over predetermined number of Raman amplifiers; and power of the pumping light is raised in the predetermined number of Raman amplifiers. The power is raised to ensure that the target performance is met.

This is the goal of the controller, and the purpose of the Namiki control system. Additionally, it is inherent that the multiplexers have a predetermined value in each group of amplifiers because it is necessary for one to select the multiplexers to use in the system, which would inherently entail pre-selecting the characteristics of the multiplexers. Thus, because no matter how many amplifiers are present in the system, be it two, or one hundred, the multiplexers would always have a predetermined characteristic, based on the fact that the system must be created before it is used, and therefore some one or thing must select the components to use. By selecting the multiplexers, there is an inherent choice of the multiplexer characteristics.

2. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Namiki et al. (2001/0050802) (Namiki) in view of Kidorf et al. (6,052,219) (Kidorf) as applied to claim 4 above, and further in view of Foursa (2002/0075560) (Foursa).

Regarding claim 11, Namiki in view of Kidorf fails to teach that the transmission line accommodates "m" optical fibers; and "m" pumping lights having different wavelengths are multiplexed in each of the Raman amplifiers, and a multiplexed pump light is respectively provided to the "m" optical fibers. Such is well known in the art and is shown in the Foursa publication. See for example, fig. 4; paragraph 0039. It would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to employ the pumping

configuration of Foursa to the amplifier of Namiki because such would enable a designer to increase the system bandwidth by, for example (as shown in fig. 4 of the Foursa reference), four times.

Regarding claim 12, Namiki does teach a polarization coupled light is obtained by polarization coupling two pump lights, which is further multiplexed by a multiplex. Namiki does not teach that the Raman amplifier comprise a multiplexer having both "m" input ports and "m" output ports. This is taught by the Foursa reference. See the discussion of claim 11, above, which is hereby incorporated by reference in its entirety.

3. Claims 15 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Namiki et al. (2001/0050802) (Namiki) in view Kidorf in Kidorf et al. (6,052,219) (Kidorf) in view of Wu et al. ('921) (Wu) and further in view of Giles et al. (5,241,414) (Giles)

Regarding claims 15 and 16, the teachings of Namiki have been discussed above with respect to claims 4 and 5, which is hereby incorporated by reference in its entirety. Namiki teaches that the control unit may send various operating parameters to the network control system. See, e.g., figs. 5, 10. Namiki does not teach that the power of each of the pump lights in the plurality of the Raman amplifier is detected by the first optical terminal station. This limitation has been rejected as being indefinite for failing to distinctly claim what the

applicant regards as his or her invention, and will be interpreted in light of the disclosure.

Wu teaches that information on the pump powers, which are inherently determined by back facet monitors (see fig. 7, 80) may be relayed over a telemetry channel to a network control and management station, which is located at a terminal station. See, e.g., column 6, line 54 to column 8, line 12.

Kidorf teaches an optical transmission system wherein a plurality of optical amplifiers amplify optical signals on a system including a first and a second optical transmission line.

Neither Namiki nor Kidorf teach an optical device to multiplex light pump light and guide the multiplexed pump light to both of the first and second optical transmission lines. Such a device was well known in the art at the time of invention by Applicant, for example see Giles' M x N Star coupler.

It would have been obvious to one of ordinary skill in the art at the time of invention by Applicant to modify the apparatus, of Namiki, by providing a second transmission line transmitting signals counter-directionally to first transmission line in order to allow information to be transmitted in both directions; and to modify the apparatus to include a controller that communicated the detected pump powers over to a first terminal station because such is well known in the art and allows for more effective system monitoring and further allows the pumps of adjacent amplifiers to be controlled in the event of a pump failure, as described in the Namiki reference; and to further modify the apparatus by substituting Giles'

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star coupler in order to provide pump light to multiple amplifiers without requiring an increased number of pump sources.

Response to Arguments

Applicant's arguments filed 12-31-2003 have been fully considered but they are not persuasive. The examiner disagrees with Applicant's argument that that "the present invention is directed an optical transmission system having a bi-directional transmission line that is not as independent as the optical transmission fiber paths taught by Kidorf et al." The instant invention and the Kidorf reference both teach independent waveguide paths. It is true that the Kidorf reference does not teach that both fiber paths share a single array of pump sources; this limitation, introduced in the instant amendment, has been accounted for using the Giles reference.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen C. Cunningham whose telephone number is 703-605-4275. The examiner can normally be reached on Monday - Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas G. Black can be reached on 703-305-8233. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SCC

[Handwritten Signature]
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